REMARKS

Claims 1-46 are pending. Claims 8 and 26 are objected to because of informalities. Claims 45-46 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Claims 1-9, 22-27,36, 38, and 42-45 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,039,346 to Ratnakar. Claims 10-13 and 27-28 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,118,552 to Suzuki et al. Claims 15-21 and 31-35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,038,346 to Ratnakar. Claims 30, 37, 39, and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,038,346 to Ratnakar in view of U.S. Patent No. 6,512,793 to Maeda. Claims 14, 29, and 40-41 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reconsideration is requested. No new matter is added. The specification is amended to correct typographical errors. FIG. 4B is amended to correct a typographical error. Claim 8 is amended as suggested by the Examiner to overcome the informality. While claim 26 does not include the informality indicated by the Examiner, claim 36 does include this informality, which is corrected as suggested by the Examiner. Claim 39 is amended to correct a typographical error. Claims 1, 8, 10, 15, 22, 27, 31, 36, 38-39, and 45 are amended. Claims 47-50 are added. Claims 9, 13-14, 21, 26, 28-29, 40-41, and 44 are canceled. The rejections are traversed. Claims 1-8, 10-12, 15-20, 22-25, 27, 30-39, 42-43, and 45-50 remain in the case for consideration.

The features of claim 14, which the Examiner has indicated is allowable, and claim 13 have been added to claim 10, and claims 13-14 have been canceled. Accordingly, claims 10-12 should now be allowable.

The features of claim 29, which the Examiner has indicated is allowable, and claim 28 have been added to claim 27, and claims 28-29 have been canceled. Accordingly, claim 27 should now be allowable.

Claims 40-41 have been canceled and rewritten as new claims 49-50. Accordingly, claims 49-50 should now be allowable.

The Examiner indicated that he did not receive a copy of the Appendix. The Applicant does not understand what happened, because the Applicant has a record of sending the Appendix. In any event, a new copy of the Appendix is hereby provided.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 101

The Examiner rejected claims 45-46 as being directed toward nonstatutory subject matter under MPEP 2106 IV B.1(b). The Examiner takes the position that claims 45-46 do not exhibit any functional interrelationship with the way in which computing processes are performed. Claim 45 has been amended to recite the memory being accessed by an application program being executed on a computer. This amendment makes claim 45 consistent with the holding in *In re Lowry*, 32 U.S.P.Q. 1031 (Fed. Cir. 1994), where the Board of Patent Appeals and Interferences held that a claim to memory containing stored information recited an article of manufacture was patentable. Accordingly, claims 45-46 should be allowable under 35 U.S.C. § 101.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 102(e)

Referring to claim 1, the invention is directed toward a method for compressing an indexed color image, the method comprising: identifying a pixel color for a pixel; identifying a left neighbor color for a left neighbor of the pixel; identifying an upper neighbor color for an upper neighbor of the pixel; comparing the pixel color with the left neighbor color and the upper neighbor color; selecting a probability model from a probability set, the probability set including at least two probability models, each probability model including at least two probabilities for the pixel color; encoding the pixel color based on the comparison using the probability model; and updating the probability model. Claim 22 is a Beauregard claim paralleling claim 1.

Referring to claim 15, the invention is directed toward a method for decompressing an indexed color image on a computer, the method comprising: decoding a probability value for a compressed color for a pixel; selecting a probability model from a probability set, the probability set including at least two probability models, each probability model including at least two probabilities for the pixel color; determining whether the probability value represents the same color as a left neighbor color for a left neighbor of the pixel or an upper neighbor color for an upper neighbor of the pixel using the probability model; decoding an uncompressed color for the pixel; and updating the probability model. Claim 31 is a Beauregard claim paralleling claim 15.

Referring to claim 36, the invention is directed toward an apparatus comprising: a computer including a processor and a memory; an indexed color image loaded in the memory of the computer; a color palette specifying colors in the image; a probability set, including at least two probability models, each probability model including at least two probability values

for a color of a pixel given a color of a left neighbor of the pixel and a color of an upper neighbor of the pixel; selection means to select the probability model from the probability set; an update module designed to update the probability value in the probability model given the color of the pixel, the color of the left neighbor of the pixel, and the color of the upper neighbor of the pixel; and a compressor designed to compress the color of the pixel using the color palette.

In contrast, Ratnakar teaches a method for lossless image compression. Ratnakar tracks both the values of the immediate 4 encoded neighbors of the current pixel and the runs along those same directions (termed west, northwest, north, and northeast). Labels are assigned to each pixel in the neighborhood. Ratnakar then determines the label associated with the largest number of successful predictions. That label is then used to predict the current pixel. If the prediction is correct, a SUCCESS symbol is appended to a Trend list. If the current pixel has a label corresponding with a less likely neighbor, then a special symbol is appended to the Trend list, identifying the actual neighbor that correctly predicted the pixel. In either of these cases, the correctly predicting label is updated to reflect the correct prediction. Finally, if the current pixel does not have the same label as any of its neighbors, a special symbol is appended to the Trend list, and the actual value of the pixel is appended to an Anomaly list.

Claims 1, 15, 22, 31, and 36 are all amended to describe the use of probability sets. Based on the Examiner's rejection of dependent claims 9, 21, 26, and 44 (now canceled in favor of including these features in the above-listed independent claims), the Examiner is applying a "plain meaning" interpretation to the term "probability set." For example, in rejecting claim 9, the Examiner cited to Table 2, and to column 7, line 6 of Ratnakar. Column 7, line 6 describes the various probabilities p_A, p_B, p_C, and p_D. (What the Examiner meant by referring to Table 2 is unclear to the Applicant, as Table 2 lists special symbols used *only after* the current pixel level has been compared with the predicted pixel levels based on the neighbor pixels: these special symbols are *not* probabilities.)

The Applicant has specific definitions intended for the term "probability set" and "probability model." As described in the specification at page 7, lines 20-30, a "probability model" is a set of probabilities, and a "probability set" is a set of probability models. In other words, a probability set, as used by the Applicant, is a set *of sets* of probabilities.

The combination of the various probabilities p_A, p_B, p_C, and p_D into a unitary object might be analogous to the probability model of the claimed invention. But nowhere does Ratnakar teach or suggest the use of multiple probability models (that is, having more than

one of each of p_A, p_B, p_C, and p_D). Thus, Ratnakar does not teach or suggest all of the features of claims 1, 15, 22, 31, and 36, and claims 1-8, 15-20, 22-25, 30-39, and 42-43 are allowable under 35 U.S.C. § 102(e) over Ratnakar.

Referring to claim 10, the invention is directed toward a method for compressing an indexed color image on a computer, the method comprising: detecting a background color of the image; selecting a part of the image that includes a color other than the background color, the selected part of the image including at least two pixels; dividing the selected part of the image into at least two tessellations of blocks, each tessellation of blocks including at least one block, wherein each block includes at least one pixel with a color other than the background color and each pixel in the image with a color other than the background color is included in exactly one block in each tessellation; estimating a size for each tessellation, wherein each block in each tessellation is compressed separately; selecting a tessellation with a smallest estimated size; and compressing each block in the selected tessellation separately. Claim 27 is a Beauregard claim paralleling claim 10.

As a preliminary point, the Applicant notes that the Examiner rejected claim 10 under 35 U.S.C. § 102(e) as being anticipated only by Suzuki. But claim 27 is a Beauregard claim paralleling claim 10, and the Examiner rejected claim 27 under 35 U.S.C. § 102(e) as being anticipated by both Suzuki and Ratnakar. For purposes of this analysis, the Applicant treats claim 10 as rejected under 35 U.S.C. § 102(e) as being anticipated by both Suzuki and Ratnakar. As claims 10 and 27 stand rejected under 35 U.S.C. § 102(e) over both Ratnakar and Suzuki, the analysis of claims 10 and 27 must be split between the two references cited as prior art.

Ratnakar: The Examiner cited to column 9, lines 39-42 and 61-63 of Ratnakar as teaching the features of claims 10 and 27. Specifically, the Examiner referred to column 9, lines 39-40 as teaching selecting a part of the image that includes a color other than the background color. The cited portion of Ratnakar uses integer variables i and j, which index into the image. But I(i,j) is the color of a single pixel: it does not refer to a part of the image including two or more pixels. In fact, Ratnakar does not teach or suggest anywhere the ability to operate on only parts of the image; Ratnakar teaches a compression algorithm that works, pixel by pixel, on the entire image. Claims 10 and 27 have been amended to describe the selected part of the image as including at least two pixels. Accordingly, Ratnakar does not teach or suggest all of the features of claims 10 and 27, and claims 10-12, 27, and 30 are allowable under 35 U.S.C. § 102(e) over Ratnakar.

Suzuki: Claim 10 has been amended to include the limitations of claim 13, which has been canceled. In rejecting claim 13, the Examiner cited to FIG. 3 of Suzuki as showing an image divided into at least two tessellations of blocks, estimating a size for each tessellation, and for selecting a tessellation with the smallest size. But FIG. 3 does not show multiple tessellations of an image. Instead, FIG. 3 shows the two-step process that Suzuki uses for encoding images. FIG. 3(a) shows the original image. In FIG. 3(b), the color portion of the image has been detected and replaced with white pixels. This makes it possible for Suzuki to encode the entire image, treating the entire image as monochrome. Then, Suzuki separately encodes the color region, as shown in FIG. 3(c). In other words, Suzuki performs only *one* tessellation of the image: Suzuki separates the monochrome and color portions of the image (this is the tessellation), and then separately encodes each part.

It might be useful to refer back to the drawings. In FIG. 4B of the patent application, a part of the image is shown tessellated in two different ways. Image 435 tessellates the part of the image one way, and image 440 tessellates the part of the image another way. (It is worth noting that the use of the word "tessellation" in claims 10 and 27 is consistent with the ordinary definition of the word.) Each pixel in the part of the image appears in some block in each tessellation. The same cannot be said for Suzuki: if tessellation were to be interpreted as the blocks used in subdividing the image (such an interpretation would be directly contrary to both the ordinary definition of "tessellation" and the Applicant's intended meaning), then each pixel appears in exactly one block. Accordingly, Suzuki does not teach or suggest all of the features of claims 10 and 27, and claims 10-12, 27, and 30 are allowable under 35 U.S.C. § 102(e) over Suzuki.

Referring to claim 38, the invention is directed toward an apparatus. The apparatus of claim 38 depends from claim 36, and: the image includes a background color; and the apparatus further comprising a block locator for locating a block in the image, the block including at least one pixel with a color other than the background color and at least a second pixel.

The Examiner cited to column 9, lines 39-42 of Ratnakar as teaching these features. Specifically, the Examiner referred to column 9, lines 39-40 as teaching a block locator. But, as described, the block locator locates blocks with at least two pixels. The cited portion of Ratnakar uses integer variables i and j, which index into the image. But I(i,j) is the color of a single pixel: it does not locate a block of pixels. In fact, Ratnakar does not teach or suggest anywhere the ability to locate blocks of pixels; Ratnakar teaches a compression algorithm that works, pixel by pixel, on the entire image. Claim 38 has been amended to describe the

block as including at least two pixels. Accordingly, Ratnakar does not teach or suggest all of the features of claim 38, and claim 38 is allowable under 35 U.S.C. § 102(e) over Ratnakar.

Referring to claim 45, the invention is directed toward a memory for storing a compressed image file for access by an application program being executed on a computer, comprising: a data structure stored in said memory, said data structure including: dimensions for the image; a color palette for the image; a background color of the image; and at least one compressed block, the compressed block including a location for the block, dimensions for the block, and at least one pixel compressed using a dynamic probability model, the compressed block including a subset of pixels in the image.

Claim 45 describes a compressed block as including a subset of the pixels in the image. In other words, the compressed block does not include all of the pixels in the image. But Ratnakar teaches only compressing the entire image. Ratnakar does not teach or suggest applying the described compression algorithm to a subset of the image. Accordingly, Ratnakar does not teach or suggest all of the features of claim 45, and claims 45-46 are allowable under 35 U.S.C. § 102(e) over Ratnakar.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 103(a)

Referring to claim 39, the invention is directed toward an apparatus. The apparatus of claim 39 depends from claim 36, and further comprises a size estimator designed to estimate the size of the compressed image using a division of the image.

The Examiner acknowledges that Ratnakar does not teach a size estimator. Instead, the Examiner refers to Maeda as teaching the size estimator. The Examiner cites to column 11, line 52 in support of this position. But Maeda teaches how to *decompress* data. The code data shown in FIG. 12 (which is what column 11, lines 46-59 describes) is a block of data *that has already been compressed.* This means that the size code of the code data is a *known* quantity: it is the size of the object, after it is decompressed. Thus, the size code of Maeda is not an *estimate* of the size of a compressed image, as claimed. Accordingly, neither Ratnakar nor Maeda teaches nor suggests all of the features of claim 39, and claim 39 is allowable under 35 U.S.C. 103(a) over Ratnakar in view of Maeda.

For the foregoing reasons, reconsideration and allowance of claims 1-8, 10-12, 15-20, 22-25, 27, 30-39, 42-43, and 45-50 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.

Ariel S. Rogson
Reg. No. 43,054

MARGER JOHNSON & McCOLLOM, P.C.
1030 SW Morrison Street
Portland, OR 97205
503-222-3613
Customer No. 20575

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